

Second Affidavit

I, Kuang-Lang Huang of No. 1 Lane 328, Fu-Te 1<sup>st</sup> Road, Hsi-Chih City, Taipei  
Country 211 Taiwan, R.O.C. state as follows:



- I. I am one of the co-inventors of the subject patent application, U.S. Patent Application Serial No. 09/782,072. I have a Ph.D. degree of physics of National Taiwan University and am presently employed as the engineer in chief in AirTree Ozone Technology Co., Ltd. I have been working in this position for more than three years. My professional specialty is in the field of the manufacturing of ozone generator, molecular dynamics, and spectroscopy. I can and do attest that the facts stated below are true and correct to the best of my knowledge.
- II. The method of gilding according to the method claimed in the subject patent application is primarily applied to the electrodes in ozone generators, wherein the requirements on the quality of coating are substantially different from those of general gold plating. Under the operating conditions for ozone generators, the electrodes are required to withstand high temperatures, high electric current, and high voltage.
- III. Baking temperature maintained in a range between 780°C and 880°C is significant in connection with the method of the subject patent application.
- (1) While the temperature is above 880°C, the Au (gold) coating evaporates thereby thinning the coating thickness and ultimately increasing the manufacturing cost.
  - (2) While the temperature is below 780°C, the Au coating does not adhere well to the surface of the tube made of quartz and  $Al_2O_3$ , particularly when the tube is used as the electrodes of an ozone generator, in which the electrode have to endure high temperature, high electric current, and high voltage. Scaling an Au coating from the tube surface decreases the efficiency of the ozone generator and may even cause damage to the ozone generator.
  - (3) For Au coating used for general purposes, a range of baking temperature greater than 780°C and 880°C is acceptable. However, if the Au coating is to be used in the electrodes of an ozone generator, in which the electrodes must withstand high temperature, high electric current, and high voltage, maintaining the baking temperature in the range between 780°C and 880°C is crucial.
  - (4) Attached is a color photograph of: (i) samples of gold coated tubes used for ozone generator electrodes that were produced according to the method claimed in the subject patent application; and (ii) samples of gold coated tubes in which the baking temperatures were outside of the claimed 780 to 880°C baking temperature range.

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- (5) All the tubes were prepared by uniformly smearing an  $\text{AuCl}_3$  solution of 10-11% concentration, diluted by a sulfur-containing volatile oil, on the cleaned and dried surfaces of the quartz or high aluminum-oxide-containing tubes. The tubes were kept at room temperature for thirty minutes and then put into a stove for baking. The temperature in the stove was varied for the different samples, as indicated by the arrows and temperature values below each sample in the attached color photograph. The tubes were each baked for the same amount of time, between 10 and 14 hours. After baking, the temperature in the stove was reduced to  $100^\circ\text{C}$  and the tubes were taken out of the oven and kept at room temperature for cooling.
- (6) As seen in the photograph, at a baking temperature of  $800^\circ\text{C}$ , the tube has the "goldest" color and the least amount of the blackish-colored un-oxidized solvent as compared to tube baked at other higher and lower temperatures. The blackish-colored coating on the tubes baked at temperatures below  $800^\circ\text{C}$  is indicative of an inferior ozone generating electrode with a higher electrical resistance and thus, is more susceptible to damage from higher operating temperatures. For baking temperatures above  $900^\circ\text{C}$ , the gold coating evaporates during baking resulting in a thinner coating as indicated by the lighter colors of the tubes.
- (7) This difference in results, based solely on the difference in baking temperature, would have been unexpected to one of ordinary skill in this art.

V. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful and false statements may jeopardize the validity of the application or any patent issued thereon.

Dated this 10th day of May, 2004.

Kuang-Lang Huang  
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